

Biomedical applications of optics

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Abstract content
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Special Chars

Mammalian cells can be optically micro-manipulated in-vitro to promote embryonic stem cell research, neurodegenerative disorder studies, human immunodeficiency virus (HIV-1) investigations and cancer research science. In this work, lasers of different regimes are employed as they possess special properties that allow classical biomedical applications. Studies toward the interaction of laser light, nanomaterials and biological materials can lead to an understanding of a wealth of disease conditions and result in photonics-based therapies and diagnostic tools. In this talk; firstly, optical transfection and differentiation of embryonic stem cells is presented. Secondly, somatic and dendritic phototransfection of neuroblastoma cells on graphene substrates is shown. Thirdly, using different beam shapes photo-translocation of HIV-1 drugs into TZM-bl cells is given. Finally, optical trapping and sorting of cancerous from healthy ones is demonstrated.

Primary author: Dr MTHUNZI, Patience (CSIR - NLC)

Co-authors: Prof. FORBES, Andrew (National Laser Center, CSIR); Dr WARNER, Jamie (Department of Materials, University of Oxford); Mr HE, Kuang (Department of Materials, University of Oxford); Prof. PAPATHANASOPOULOS, Maria (Department of Molecular Medicine and Haematology, University of the Witwatersrand Medical School); Mr NGCOBO, Sandile (National Laser Center, CSIR); Ms KHANYILE, Thulile (National Laser Center, CSIR)

Presenter: Dr MTHUNZI, Patience (CSIR - NLC)

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